

Deployment of a 200 kg/day Zero Emissions Hydrogen Production Technology

Low carbon intensity hydrogen is needed to help transition our energy systems towards a low carbon future. Thermal cracking, which converts methane to hydrogen and solid carbon, is a leading candidate for next generation hydrogen production as it produces very little carbon dioxide and uses no water, unlike current hydrogen production methods. Although the cost of thermal cracking is decreasing as the technology matures, there is a need for significant additional reductions in cost through this project to enable widespread implementation.

In this project, a novel thermal cracking technology is being field tested with ATCO to demonstrate the production of clean hydrogen from natural gas for use in the natural gas distribution system. The project aims to demonstrate hydrogen production with zero-emissions and at a lower cost than steam methane reforming. In addition, the project will explore market opportunities from the solid carbon that is produced.



RECIPIENT:
MéridaLabs

**University of British
Columbia**



PARTNERS:
ATCO

**Wood Engineering
UBC**



TOTAL BUDGET:
\$7,092,917



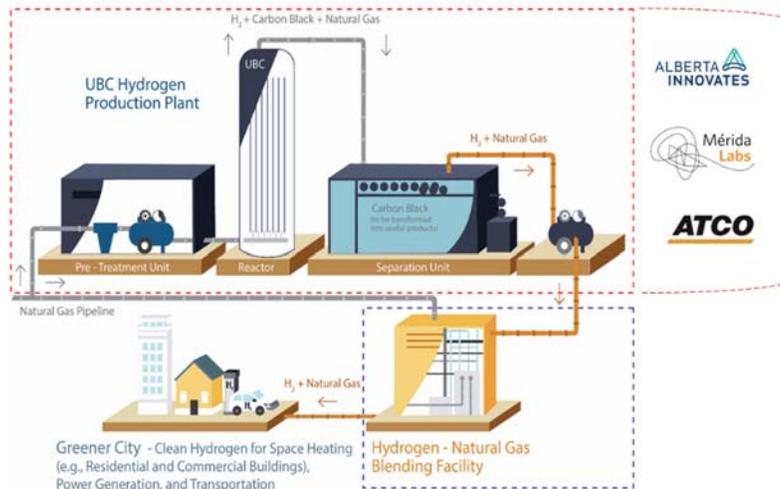
AI FUNDING:
\$4,979,834
TIER



PROJECT DATES:
**MAR 2021 –
FEB 2023**



PROJECT TRL:
**Start: 5
End: 7**



APPLICATION

Hydrogen is useful as a replacement for diesel in commercial and heavy freight transportation, replacing natural gas for residential and commercial heating, and for industrial processes as a feedstock as it releases no carbon dioxide when used, only water. This test unit will be deployed at the ATCO natural gas blending station in Fort Saskatchewan to demonstrate hydrogen blending in a natural gas distribution system. The technology can be deployed anywhere there is a natural gas source.

CLEAN RESOURCES

CLEAN TECHNOLOGY

CARBON CAPTURE UTILIZATION AND STORAGE AND HYDROGEN - HYDROGEN

PROJECT GOALS

- Scale up the plant design to 200 kg/day capacity
- Install and operate the plant at ATCO's Fort Saskatchewan natural gas blending point
- Coordinate with ATCO's Emissions Reduction Alberta-funded hydrogen blending project to match production requirements
- Development of carbon black purification technology
- Determine potential market opportunities for produced carbon
- Identify at least one customer in Alberta for the carbon black by-product
- Collaborate with major stakeholders in Alberta and BC to develop a hydrogen innovation ecosystem in Western Canada to support technology development

BENEFITS TO ALBERTA

- Development of technology that allows Alberta's natural gas industry to thrive in a low carbon economy
- Enable the reduction of carbon intensity of residential and commercial heating
- Establishment of a successful university spinoff company to commercialize the thermal cracking technology.
- Creation of new jobs to develop, demonstrate, and commercialize the technology.
- Growth of Alberta's high tech, clean energy economy.



6 Publications



2 Students
Trained



3-4 Patents



9-17 Project Jobs



2 New
Products/Services



1 Spinoff
Company



500-600 Future
Jobs



6,214 T/yr Future
GHGs Reduced

CURRENT STATUS

JUN 2021

FEED for pilot plant completed. Contractor selected for detailed design. New team members retained. Prototype reactor constructed. Patent plan being progressed. Construction, installation, commissioning, startup and troubleshooting of the pilot plant will commence upon completion of detailed design.